IN THE SPECIFICATION

Please replace the abstract with the following:

Methods and apparatuses for assembling a structure onto a substrate. A method according to one aspect of the invention includes dispensing a slurry onto a substrate wherein the slurry includes a first plurality of elements, each of which is designed to mate with a receptor region on said substrate and each of which comprises a functional element. ~~, and wherein the slurry also includes a second plurality of elements which are not designed to mate with receptor regions on the substrate. Typically, these second plurality of elements help movement of the first plurality of elements.~~ ~~A~~ The method further ~~according to another aspect of the invention~~ includes dispensing in a flow having a first direction a slurry onto a substrate, wherein the slurry includes a fluid. ~~and a plurality of elements, each of which is designed to mate with a receptor region on the substrate and each of which includes a functional element, and vibrating substrate in a second direction which is substantially perpendicular to the first direction. A method according to another aspect of the invention includes creating a slurry comprising of fluid and a plurality of elements, each of which is designed to mate with a receptor region on the substrate and each of which comprises a functional element, and projecting the slurry through a nozzle toward the substrate. In one particular implementation of this aspect, additional nozzles may be used to provide suction or additional fluid or additional slurry. A method according to another aspect of the invention includes dissolving a bonding agent into a solvent to create a fluid, dispensing a slurry onto a substrate, wherein the slurry includes the fluid and a plurality of elements each of which is designed to mate with a receptor region on the substrate and each of which comprises a functional element, and evaporating the solvent after each of the plurality of elements has mated with a corresponding receptor, wherein the bonding agent bonds each of the plurality of elements to the corresponding receptor region.~~

Please replace the second paragraph on page 4 with the following:

Thus the process which uses fluidic self assembly typically requires forming openings in a substrate in order to receive the elements or blocks. Methods are known in the prior art for forming such openings and are described in U.S. Patent No. 5,545,291. One issue in forming an opening is to create its sidewalls so that blocks will self-align into the opening and drop into the opening. The substrate having openings in the glass layer 10 may be used as a receiving substrate to receive a plurality of elements by using a fluidic self assembly method. Figure ~~1A~~ 1B shows an example where a separately fabricated element 16 has properly assembled into the opening 14. However, it has been discovered that at times, an element 16 will not properly assemble into an opening 14 due to the fact that the element 16 becomes turned upside down and then lodges in the top of the opening 14. An example of this situation is shown in Figure ~~1B~~ 1A. Often times, the inverted element 16 lodges into the opening 14 so tightly that it remains in the opening and prevents non-inverted elements from falling into the opening 14. Thus, the opening at the end of the assembly process will typically not be filled with an element or perhaps worse, may still contain an inverted element lodged at the top of the opening 14.

Please replace the first paragraph on page 25 with the following:

The various different methods of the present invention will typically create an array of openings on a receiving substrate. These openings are then filled with a plurality of elements, each of which typically include at least one function component, such as a pixel driving circuit for driving a liquid crystal cell in an active matrix liquid crystal display or other display driving elements for other types of displays. Co-pending U.S. Patent Applications Serial Nos. 09/251,220 and 09/251,268 filed February 16, 1999 by John Stephen Smith and assigned to the same Assignee of the present invention describe an example of the electrical circuitry disposed on each element which is to be assembled into an opening. These co-pending applications are hereby incorporated herein by reference. Generally, these elements resemble tapered blocks having a trapezoidal cross-section where the top of the block is wider than the bottom of the block. An example of such a block is shown as block 16 in **Figure 1D**. Various improved methods for forming these blocks are described in co-pending U.S. Patent Application Serial No. [[________]] 09/433,605, which was filed concurrently herewith by John Stephen Smith, Mark Hadley and Jay Tu which is assigned to the same Assignee as the present invention and which is entitled "Methods for Creating Elements of Predetermined Shape and Apparatuses Using These Elements" and which is hereby incorporated herein by reference. In one preferred embodiment, the electrical circuits are fabricated as described in U.S. Patent Applications Serial Nos. 09/251,220 and 09/251,268 in blocks which are fabricated as described by the U.S. Patent Application entitled "Methods for Creating Elements of Predetermined Shape and Apparatuses Using These Elements." **Figures 9A** through **9D** will now be referred to in describing one example of a

method of assembling the blocks into the openings in order to create a completed assembly.

Please replace the first paragraph on page 29 with the following:

Hydrophobic surfaces on blocks can be created by cleaning and oxidizing the blocks as described above, and then reacting a self-assembled monolayer onto the surface, such that the hydrocarbon chains of the self-assembled monolayer are topmost at the surface. Typically the contact angle of water on these hydrophobic surfaces is at least 90 degrees. [[Teflon]] TEFLON, which can be deposited or formed on the surfaces of the blocks, will also act to create hydrophobic surfaces on the blocks. Other types of coatings of a hydrophobic nature may be used or a fluorine plasma may be used to create hydrophobic surfaces on the blocks.

Please replace the second paragraph on page 38 with the following:

Once the substrate is dry, the fluidic self assembly process is complete. At this time, if necessary, repair of blocks that are tilted in their receptor sites can be accomplished with the use of heat and mechanical pressure in a number of different ways. The substrate can be heated to a temperature that softens the bonding agent, and then pressure can be applied either locally with a point source, more globally with a roller apparatus, or globally with weight or other form of applied pressure. In this step it is important that the surface pressed against the filled substrate will not stick to the blocks in the receptor sites or to the substrate. In one example, Solutia Scripset 550 was used as the bonding agent, the substrate was heated to 120°C, and then pressed between perfluoroalkoxy polymer films with approximately 500 psi

for 1 minute. The substrate is then cooled while under pressure. The pressure is released and the perfluoroalkoxy films were removed. In another example with the same bonding agent, a [[Teflon]] <u>TEFLON</u> roller, made out of [[Teflon]] <u>TEFLON</u> tubing placed over a steel rod, was rolled across the substrate after it was heated to 120°C. Both of these processes reduced the number of tilted blocks that remained after the completion of the FSA.

<u>Please replace the first paragraph on page 39 with the following</u>:

Figures 9E, **9F**, **9G**, **9H** and **9I** show the result of an FSA process which fills an opening created using a method according to the process illustrated in **Figures 3A-3G**. **Figure 9E** begins with the opening 351 in a glass substrate 350. A block (shown in this case as a silicon [[Nanoblock]] <u>NANOBLOCK</u> 353, where [[Nanoblock]] <u>NANOBLOCK</u> is a trademark of Alien Technology, Inc.) is assembled through an FSA process (e.g. the method of **Figure 10**) into the opening 351 as shown in **Figure 9F**. The top portion of block 353 includes the functional component (in this case MOS circuitry, such as CMOS pixel drivers and electrode(s)) for the block. Then, as shown in **Figure 9G**, a planarizing layer 356 is applied. The planarizing layer may be applied after a bonding solution is used to bond the block to the opening. A patterned metal (or other conductive material) layer 357 is then created to electrically interconnect the block's functional component to other blocks or to other functional components. **Figure 9I** shows an electron micrograph of a block 353 in a substrate 350 after electrical interconnects 357a and 357b have been applied. Normally, many such blocks may be formed in a matrix to create, for example, the backplane of an active matrix flat panel display, such as an active matrix liquid crystal display.

Please replace the first paragraph on page 41 with the following:

An exemplary method according to another aspect of the invention will now be described in conjunction with **Figures 13A** and **13B**. A completely different approach to making block receptor sites on a glass substrate is to form the holes in an organic layer coating a glass substrate. This offers many advantages over etching holes directly into the glass. The receptor site fabrication process may be faster and easier on an organic layer than on glass. It will also yield receptor sites that are better in the sense that they more accurately match the size and shape of the [[nanoblocks]] NANOBLOCKS. **Figure 13A** shows an assembly 550 having an organic layer 553, which may be thin relative to the glass layer 551. The opening is then formed to produce the structure shown in **Figure 13B**.